IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of:

Nordine CHEIKH *et al.*

Appln. No.: 09/300,482

Filed: April 28, 1999

For: Nucleic Acid Molecules and Other Molecules Associated with the Phosphogluconate Pathway

Art Unit: 1631

Examiner: M. K. Zeman

Atty. Docket: 16517.216/38-21(15365)B

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APPELLANT'S BRIEF

Commissioner for Patents
Washington, DC 20231

Sir:

This is an Appeal from the Final Rejection of all claims pending in the above-described patent application. A Notice of Appeal was filed on March 1, 2002. The statutory fee of $320.00 for submitting this Brief is included in our attached Check No. **201060**. *This Brief is submitted in triplicate.*

1. Real Party in Interest

The real party in interest is Monsanto Company, a Delaware corporation with offices at 800 North Lindbergh Boulevard, St. Louis, Missouri 63167. Monsanto Company is a subsidiary of Pharmacia Corporation, located at 100 Route 206 North, Peapack, New Jersey 07977.

2. Related Appeals and Interferences

The Applicants are unaware of any Appeals or Interferences related to this Appeal.

3. Status of Claims

Claims 1, 2, and 10-21 are pending. Claims 3-9 were withdrawn from consideration by the Examiner, and are not under appeal. Claims 1, 2, and 10-21 stand finally rejected under 35 U.S.C. § 112, first and second paragraphs, and provisionally rejected under the judicially created doctrine of obviousness-type double patenting. Claims 1 and 10 stand finally rejected under 35 U.S.C. § 102. Appellant appeals all of the rejections of claims 1, 2, and 10-21.

4. Status of Amendments

Applicants have not filed any responses subsequent to Final Rejection in this case.

5. Summary of Invention

The invention is directed to substantially purified nucleic acid molecules that encode a maize or soybean phosphogluconate pathway enzyme. Specification at page 14, line 2 through page 20, line 4. More specifically, the invention is directed to substantially purified nucleic acid molecules that are capable of specifically hybridizing to a second nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of SEQ ID NOs: 1, 4, 14, 27, 225, 298, 311, 356, 569, 619 and complements thereof. *Id.*

6. Issues

The issues in this Appeal are:

(a) whether claims 1, 2, and 10-21 are unpatentable under 35 U.S.C. § 112, first paragraph for alleged insufficiency of written description;

(b) whether claims 1, 2, and 10-21 are unpatentable under the judicially created doctrine of obviousness-type double patenting for allegedly being unpatentable over claims in co-pending applications 09/304,517 and 09/262,979;

(c) whether claims 1, 2, and 10-21 are unpatentable under 35 U.S.C. § 112, second paragraph for alleged indefiniteness; and

(d) whether claims 1 and 10 are unpatentable under 35 U.S.C. § 102 for alleged anticipation.

7. Grouping of Claims

Patentability of claims 1, 2, and 10-21 is addressed together in Sections 8.A through 8.D below. Separate patentability of claims 1 and 10 is addressed in Section 8.E below. A copy of the claims on appeal is attached hereto as Appendix A.

8. Argument

A. Summary of Aplicants' Position

Applicants have provided an adequate written description of the claimed nucleic acids that demonstrates Applicants' possession of the claimed invention. Each genus of claimed nucleic acid molecules, *i.e.*, the nucleic acid molecules comprising the nucleic acid sequences selected from the group consisting of SEQ ID NOs: 1, 4, 14, 27, 225, 298, 311, 356, 569, 619, and their complements, has been described by the recitation of a common structural feature – the nucleotide sequences of SEQ ID NOs: 1, 4, 14, 27, 225, 298, 311, 356, 569, 619, and their complements, respectively – which distinguishes molecules in the genus from molecules not in the claimed genus. Because the specification demonstrates that Applicants had possession of (and have provided an adequate description of) the claimed genus of nucleic acid molecules, the written description rejection of claims 1, 2, and 10-21 is erroneous and should be reversed.

Claims 1, 2, and 10-21 were erroneously rejected for obviousness-type double patenting, for allegedly being directed to the same subject matter as copending applications 09/304,517 and 09/262,979. However, application 09/304,517 and 09/262,979 are no longer pending – these applications now stand abandoned in favor of continuing applications that are not directed to sequences which are identical to the claimed SEQ ID NOs of the present application. Thus, the

provisional obviousness-type double patenting rejection in the present application is improper and it should be reversed.

The Examiner erred in rejecting claims 1, 2, and 10-21 as indefinite. Her error is based on reading the claims in isolation and not as they would be read in light of the specification by one having ordinary skill in the art. It is well-settled that claims are to be read through the eyes of one having ordinary skill in the art and in light of the specification. *United States v. Telectronics, Inc.*, 857 F.2d 778, 786, 8 U.S.P.Q.2d 1217, 1223 (Fed. Cir. 1988). As such, the indefiniteness rejection is improper and should be reversed.

Claims 1 and 10 were erroneously rejected as anticipated by a reference which fails to teach any of the recited nucleic acid sequences. The Examiner improperly considered non-identical chemical compounds to anticipate claims 1 and 10 as drawn to SEQ ID NO: 14, despite the fact that the reference fails to teach the chemical composition of SEQ ID NO: 14. Moreover, the Examiner based her rejections for anticipation of claims 1 and 10 not on what exists in the art or what the art teaches. Instead, the rejections of claims 1 and 10 are based on the Examiner's theory, unsupported by any evidence, that the prior art sequences might hybridize to the recited nucleic acids under the recited hybridization conditions. Such clearly unsupported conjecture is simply not a proper basis for an anticipation rejection.

B. The Specification Provides An Adequate Written Description of the Claimed Invention

Despite the Examiner's admission that SEQ ID NOs: 1, 4, 14, 27, 225, 298, 311, 356, 569, and 619 are adequately described by the specification, the adequacy of the written description of the claimed invention has been challenged by the Examiner because the nucleic acid molecules of all of the claims are allegedly "not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s)...had possession of the claimed invention." Final Action at page 2. The bases for the Examiner's challenge are that

(1) one of skill in the art would allegedly conclude that Applicants were not in possession of the claimed nucleic acid molecules, and (2) there is allegedly an "insufficient written description to support the genus encompassed by the claim." Final Action at page 3. These are not proper bases for a written description rejection of a "comprising" claim. If they were, every "comprising" claim ever written would be invalid for failing to describe every nuance of the claimed invention. Furthermore, the specification demonstrates to one skilled in the art that Applicants were in possession of the claimed genera of nucleic acid molecules.

(1) The Specification Reflects Applicants' Possession of the Claimed Invention

The purpose of the written description requirement is to ensure that the inventors had possession of the claimed subject matter, *i.e.*, to ensure that the inventors actually invented what is claimed. *Gentry Gallery Inc. v. Berkline Corp.*, 134 F.3d 1473, 1479, 45 U.S.P.Q.2d 1498, 1503 (Fed. Cir. 1998); *Lockwood v. American Airlines*, 107 F.3d 1565, 1572, 41 U.S.P.Q.2d 1961, 1966 (Fed. Cir. 1997); *In re Alton*, 76 F.3d 1168, 1172, 37 U.S.P.Q.2d 1578, 1581 (Fed. Cir. 1996). If a person of ordinary skill in the art would, after reading the specification, understand that the inventors had possession of the claimed invention, even if not every nuance, then the written description has been met. *In re Alton*, 76 F.3d at 1175, 37 U.S.P.Q.2d at 1584. A person of ordinary skill in the art, *e.g.*, a molecular biologist, would, after reading the present specification, understand that Applicants had possession of SEQ ID NOs: 1, 4, 14, 27, 225, 298, 311, 356, 569, and 619, and their complements, as well as the enzymes they encode, and therefore, the claimed invention.

Applicants have provided the nucleotide sequences required by the claims, *e.g.*, SEQ ID NOs: 1, 4, 14, 27, 225, 298, 311, 356, 569, 619, enzymes encoded by these nucleotide sequences, and constructs or vectors including promoters which cause expression of the nucleotide sequence such that the enzymes of the present invention are produced, and have thus established

possession of the claimed invention. The fact that the claims at issue are intended to cover molecules that include the recited sequences joined with additional sequences, or that hybridize under specific conditions to the recited sequences does not mean that Applicants were any less in possession of the claimed nucleic acid molecules.[1] It is well-established that use of the transitional term "comprising" leaves the claims "open for the inclusion of unspecified ingredients even in major amounts." *Ex parte Davis*, 80 U.S.P.Q. 448, 450 (B.P.A.I. 1948). *Accord PPG Indus. v. Guardian Indus.*, 156 F.3d 1351, 1354, 48 U.S.P.Q.2d 1351, 1353-54 (Fed. Cir. 1998); *Moleculon Research Corp. v. CBS*, 793 F.2d 1261, 1271, 229 U.S.P.Q. 805, 812 (Fed. Cir. 1986).

The present application describes more than just the nucleotide sequence required by the claims (SEQ ID NOs: 1, 4, 14, 27, 225, 298, 311, 356, 569, 619), for example, it describes enzymes encoded by these nucleotide sequences (specification at page 15, line 13 through page 20, line 4, and page 50, line 7 through page 52, line 16). Furthermore, the addition of extra nucleotides or constructs utilizing the disclosed nucleotide sequences (SEQ ID NOs: 1, 4, 14, 27, 225, 298, 311, 356, 569, 619) are readily envisioned by one of ordinary skill in the art upon reading the present specification,[2] in particular at page 48, lines 6 through page 50, line 6 (describing variations in nucleotide sequences which encode enzymes of the a maize or soybean phosphogluconate pathway enzyme), page 66, line 11 through page 67, line 2 (describing methods of isolating and identifying functional characteristics using the disclosed nucleotide

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[1] If the Examiner is arguing that no possession is shown because the precise claim language is not used in the specification, then it goes beyond what is required by the law. It is well-settled that the description of a claimed invention need not be *in ipsis verbis*. *Gentry Gallery v. Berkline Corp.*, 134 F.3d 1473, 1479, 45 U.S.P.Q.2d 1498, 1503 (Fed. Cir. 1998); *In re Alton*, 76 F.3d 1168, 1175, 37 U.S.P.Q.2d 1578, 1583 (Fed. Cir. 1996); *Martin v. Johnson*, 454 F.2d 746, 751, 172 U.S.P.Q. 391, 395 (C.C.P.A. 1972).

[2] It is established patent jurisprudence that Applicants need not teach "conventional and well-known genetic engineering techniques." *E.g., Ajinomoto Co. v. Archer-Daniels-Midland Co.*, 228 F.3d 1338, 1345, 56 U.S.P.Q.2d 1332, 1337 (Fed. Cir. 2000).

sequences), and page 145 line 20 through page 146, line 4 (citing references describing the construction, manipulation and isolation of macromolecules).

(2) The Claimed Nucleotide Sequences are Sufficient to Encode the Functional Enzymes

The Examiner asserts that since "[s]everal publications document the unpredictability of the relationship between sequence, structure, and function" it would therefore be "impossible for one of ordinary skill in the art to determine what similar sequences would actually encode any functional enzymes" from reading the disclosure in the specification. Final Action at page 3. This position is unfounded. To the contrary, Applicants refer the Examiner to the following articles, copies of which are enclosed, where sequence similarity is routinely used by those of ordinary skill in the art as a predictor of function. *See, e.g.,* Venter, *et al.*, The Sequence of the Human Genome, *Science*, *291*: 1304-1351 (2001); Woese, *et al.*, Conservation of Primary Structure in 16S rRNA, *Nature*, *254*: 83-85 (1975). Accordingly, Applicants maintain that one of ordinary skill in the art would have recognized, in light of Applicants' teachings, that at the time of filing Applicants had possession of the claimed invention.

(3) Applicants Have Described the Claimed Invention

The Examiner asserts that because Applicants have not disclosed "sequences from other species, mutated sequences, allelic variants, splice variants, [and] so forth", Applicants have allegedly not adequately disclosed the claimed genus. Final Action at page 3. The Examiner appears to assert that each nucleic acid molecule within the claimed genus must be described by its complete structure. Final Action at page 4. These assertions are totally unfounded. The Federal Circuit has elucidated a test for written description wherein a genus of nucleic acids may be described by a structural feature that distinguishes members of the claimed genus from non-members of the claimed genus. *Regents of the University of California v. Eli Lilly and Co.*, 119

F.3d 1559, 1568-69, 43 U.S.P.Q.2d 1398, 1406 (Fed. Cir. 1997). Applicants have satisfied that test for written description.

In particular, Applicants have disclosed common structural features, for example the nucleotide sequences of SEQ ID NO: 1, SEQ ID NO: 4, SEQ ID NO: 14, etc. For example, if a particular vector contains the nucleotide sequence of SEQ ID NO: 1, then it is a member of the claimed genus of vectors comprising a nucleic acid sequence of SEQ ID NO: 1. *See* claim 12. Moreover, closely related nucleic acid molecules falling within the scope of claims 1, 10, and their dependents are readily identifiable - they either hybridize under the claimed conditions to SEQ ID NOs: 1, 4, 14, 27, 225, 298, 311, 356, 569, 619 (or complements thereof) or they do not. The fact that the nucleic acid molecules may comprise additional sequences or variations is beside the point. Such modifications are readily envisioned by one of ordinary skill in the art and disclosed throughout the specification. Thus, claims 1, 2, and 10-21 are supported by an adequate written description pursuant to the requirements of 35 U.S.C. § 112, and the rejection should be reversed.

C. The Claimed Nucleic Acid Molecules Are Not Unpatentable Over Co-pending Application Nos. 09/304,517 and 09/262,979

The Examiner has erroneously imposed a provisional rejection under the judicially created doctrine of obviousness-type double patenting over claims drawn to polynucleotides in Application Number 09/304,517. The Examiner alleges that several sequences which are the subject of claims in that application are not patentably distinct from sequences claimed in the present case. Final Action at page 4. Application Number 09/304,517 has been abandonedand therefore cannot support a double-patenting rejection. Continuation Application Number 09/985,678 claims priority to Application Number 09/304,517, *See* U.S. Appln. No. 09/985,678 Specification at page 1, but none of the sequences relied upon by the Examiner to impose the

provisional rejection remain a subject of any one of the pending claims in that application. *See* U.S. Appln. No. 09/985,678 Specification at page 24,247 through page 24,254.

The Examiner has erroneously imposed the same rejection over claims drawn to polynucleotides in Application Number 09/262,979. The Examiner also alleges that several sequences which are the subject of claims in that application are not patentably distinct from sequences claimed in the present case. Final Action at page 5. Application Number 09/262,979 has been abandoned in favor of Continuation Application Number 09/987,899. *See* U.S. Appln. No. 09/987,899 Preliminary Amendment filed November 16, 2001, at page 1. Furthermore, none of the sequences relied upon by the Examiner to impose the provisional rejection remain a subject of any one of the pending claims in the currently co-pending application. *See* U.S. Appln. No. 09/987,899 Specification at page 421 through page 427.

In view of the above, the provisional double patenting rejection of claims 1, 2, and 10-21 is improper and should be withdrawn.

D. The Claims Particularly Point Out and Distinctly Claim the Subject Matter Which Applicants Regard as Their Invention

The Examiner has erroneously imposed a new ground of rejection of claims 1, 2, and 10-21 as being indefinite. According to the Examiner, claims 1 and 2, as amended, are "entirely unclear [as to] which SEQ ID NO: is intended to encode which enzyme." Final Action at page 6. Furthermore, the Examiner asserts that is it unclear whether "each polynucleotide which encodes one of the enzymes [must] hybridize to all of the SEQ ID NO:s [sic]?" *Id.* The Examiner's position is unfounded.

It is axiomatic that claims are always construed in light of the specification, of which they are a part. *Netword L.L.C. v. Centraal Corp.*, 242 F.3d 1347, 1352, 58 U.S.P.Q. 2d 1076, 1079 (Fed. Cir. 2001); *Slimfold Mfg. Co. v. Kinkead Indus., Inc.*, 810 F.2d 1113, 1118, 1 U.S.P.Q. 2d 1563, 1566 (Fed. Cir. 1987). The test for determining whether terms in a given claim are

indefinite is whether one skilled in the art would understand what is claimed. *Amgen, Inc. v. Chugai Pharmaceutical Co., Ltd.*, 927 F.2d 1200, 18 U.S.P.Q.2d 1016 (Fed. Cir. 1991), *cert denied,* 112 S.Ct. 169 (1991). A person of ordinary skill in the art would understand the metes and bounds of the claims read in light of the disclosure of the specification.

The specification delineates the scope of the claims such that one of ordinary skill in the art, *e.g.*, a molecular biologist, would understand what Applicants regard as the invention. For example, the specification describes which SEQ ID NOs encode which enzymes at page 15, line 18 through page 20, line 4 and at page 51, line 1 through page 52, line 3; and Table A. Furthermore, claims 1, 10, and their dependents recite "a nucleic acid sequence selected from the group consisting of SEQ ID NOs: 1, 4, 14, 27, 225, 298, 311, 356, 569, 619 and complements thereof." Thus, the claims are clear that any polynucleotide which encodes one of the enzymes must hybridize to at least one of the recited SEQ ID NOs. One of ordinary skill in the art will very easily ascertain whether or not a nucleic acid molecule comprises a nucleic acid sequence as called for by the claim.

In view of the foregoing, the rejection for indefiniteness is improper. Thus, claims 1, 2, and 10-21 are supported by an adequate written description pursuant to the requirements of 35 U.S.C. § 112, second paragraph, and the rejection should be reversed.

E. The Claimed Nucleic Acid Molecules Are Novel

The Examiner has challenged the novelty of the claimed nucleic acid molecules in the Final Action. Claims 1 and 10 were erroneously rejected under 35 U.S.C. § 102(a), for allegedly being anticipated by AF037030 (GenEMBL Database Record, 26 November 1998). Final Action at page 5-6.

This reference does not anticipate the present claims. For a prior art reference to anticipate in terms of 35 U.S.C. § 102, every element of the claimed invention must be

identically shown in a single reference. *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 677, 7 U.S.P.Q. 2d 1315, 1317 (Fed. Cir. 1988). *See also Kalman v. Kimberly Clark Corp.*, 713 F.2d 760, 771 (Fed. Cir. 1983), *cert. denied*, 465 U.S. 1026 (1984). AF037030 does not teach every element of the claimed invention.

Although AF037030 is cited for the proposition that it anticipates claims 1 and 10 as directed to 6-phosphogluconate dehydrogenase and SEQ ID NO: 14, the Examiner admits that the AF037030 references do **not** disclose the sequence of SEQ ID NO: 14. Final Action at page 6. In fact, the sequence of AF037030 only "has 95% sequence homology with SEQ ID NO: 14". *Id.* Because the chemical disclosed in the AF037030 reference is not the same as the chemical disclosed as SEQ ID NO: 14, every element of the claimed invention has not been identically shown in the reference. *See Diversitech Corp.*, 850 F.2d at 677, 7 U.S.P.Q.2d at 1317. Accordingly, the AF037030 reference does not anticipate claims 1 or 10.

However, the Examiner contends that AF037030 anticipates claims 1 and 10 because AF037030 "is a disclosure of a mRNA/cDNA sequence for 6-phosphogluconate dehydrogenase enzyme of maize. ...AF037030 has 95% sequence homology with SEQ ID NO: 14, and would clearly hybridize to SEQ ID NO: 14 under the recited conditions." Final Action at page 6. This assertion is incorrect.

No evidence, extrinsic or otherwise, has been presented by the Examiner in support of the proposition that AF037030 would necessarily hybridize to the present nucleic acid sequence of SEQ ID NO: 14. Instead of providing evidence, the Examiner appears to shift the burden of proof to Applicants to provide evidence that the nucleic acids are not identical. This is not the law. Even if it were, as the Examiner has already admitted that the nucleic acid sequence disclosed in AF037030 is **not** identical to SEQ ID NO: 14 (*see* Final Action at page 6), any requirement to prove non-identity would seem to be moot.

AF037030 does not expressly anticipate claims 1 and 10 because it does not teach SEQ ID NO: 14 or any of the other claimed nucleic acid molecules. Further, no evidence has been provided in support of the Examiner's proposition that AF037030 would hybridize to SEQ ID NO: 14 under the recited conditions. As such, claims 1 and 10 of the present invention are not expressly anticipated by AF037030, and the rejection must be withdrawn.

Furthermore, a rejection under 35 U.S.C. § 102(a) is only proper if, *inter alia*, an anticipatory reference is available publicly. The Examiner has submitted no evidence that AF037030 was available to the public prior to Applicants' filing date. The Examiner apparantly relies on the date the nucleotide sequence was submitted to the GenBank database to establish the reference date under §102(a). However, there is no evidence that the sequence was published or otherwise available to the public.

In conclusion, AF037030 does not anticipate claims 1 and 10 because the reference does not teach SEQ ID NO: 14, or any of the other claimed nucleic acid molecules. Further, no evidence has been provided in support of the Examiner's proposition that the AF037030 sequences will hybridize to the recited nucleic acids under the recited hybridization conditions. Finally, there is no evidence that the sequence submitted the GenBank database was available to the interested public as of the date of submission. As such, claims 1 and 10 of the present invention are not expressly or inherently anticipated by AF037030, and the rejection must be withdrawn.

CONCLUSION

In view of the foregoing, it is respectfully requested that the Board of Patent Appeals and Interferences reverse the Rejections and that the subject application be allowed forthwith.

Respectfully submitted,

Date: May 1, 2002

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APPENDIX A

1. A substantially purified nucleic acid molecule the encodes a maize or soybean phosphogluconate pathway enzyme, wherein said maize or soybean phosphogluconate pathway enzyme is selected from the group consisting of:

(a) glucose-6-phosphate-1-dehydrogenase;

(b) 6-phosphogluconate dehydrogenase;

(c) D-ribulose-5-phosphate-3-epimerase;

(d) ribose-5-phosphate isomerase;

(e) transketolase;

(f) transaldolase; and

(g) phosphoglucoisomerase;

wherein the substantially purified nucleic acid molecule comprises a nucleic acid sequence that hybridizes under conditions of 6.0 X sodium chloride/sodium citrate (SSC) at about 45°C, followed by a wash of 2.0 X SSC at 50°C to a nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of SEQ ID NOs: 1, 4, 14, 27, 225, 298, 311, 356, 569, 619 and the complements thereof.

2. The substantially purified nucleic acid molecule according to claim 1, wherein said substantially purified nucleic acid molecule comprises a nucleic acid sequence selected from the group consisting of SEQ ID NOs: 1, 4, 14, 27, 225, 298, 311, 356, 569, and 619.

10. An isolated nucleic acid molecule comprising a sequence that hybridizes under conditions of 6.0 X sodium chloride/sodium citrate (SSC) at about 45°C, followed by a wash of 2.0 X SSC at 50°C to a nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of SEQ ID NOs: 1, 4, 14, 27, 225, 298, 311, 356, 569, 619 and complements thereof.

11. The isolated nucleic acid molecule, according to claim 10, wherein said isolated nucleic acid molecule comprises a nucleic acid sequence selected from the group consisting of SEQ ID NOs: 1, 4, 14, 27, 225, 298, 311, 356, 569, and 619.

12. The isolated nucleic acid molecule according to claim 10, wherein said isolated nucleic acid molecule comprises a nucleic acid sequence of SEQ ID NO: 1.

13. The isolated nucleic acid molecule according to claim 10, wherein said isolated nucleic acid molecule comprises a nucleic acid sequence of SEQ ID NO:4.

14. The isolated nucleic acid molecule according to claim 10, wherein said isolated nucleic acid molecule comprises a nucleic acid sequence of SEQ ID NO: 14.

15. The isolated nucleic acid molecule according to claim 10, wherein said isolated nucleic acid molecule comprises a nucleic acid sequence of SEQ ID NO: 27.

16. The isolated nucleic acid molecule according to claim 10, wherein said isolated nucleic acid molecule comprises a nucleic acid sequence of SEQ ID NO: 225.

17. The isolated nucleic acid molecule according to claim 10, wherein said isolated nucleic acid molecule comprises a nucleic acid sequence of SEQ ID NO: 298.

18. The isolated nucleic acid molecule according to claim 10, wherein said isolated nucleic acid molecule comprises a nucleic acid sequence of SEQ ID NO: 311.

19. The isolated nucleic acid molecule according to claim 10, wherein said isolated nucleic acid molecule comprises a nucleic acid sequence of SEQ ID NO: 356.

20. The isolated nucleic acid molecule according to claim 10, wherein said isolated nucleic acid molecule comprises a nucleic acid sequence of SEQ ID NO: 569.

21. The isolated nucleic acid molecule according to claim 10, wherein said isolated nucleic acid molecule comprises a nucleic acid sequence of SEQ ID NO: 619.